Internet Survey Topline Results

Methodology

Survey question development and pretesting

The survey questions were developed by PRR and the EPA, with input from NHTSA (National Highway Traffic Safety Administration) and OMB (Office of Management and Budget). The survey questions were pretested in seven cognitive interviews.

A total of six different versions of the survey were used. These six versions differed only in regard to:

- Which of the three label designs was presented in the survey
- The order in which the labels were presented in the survey questions (to control for stimulus order effects)

Sampling and survey implementation

Two sources of new vehicle buyers were used:

- those who requested a price quote from a dealer (Autobytel, [HYPERLINK "http://www.autobytel.com"]) and who indicated that they had purchased a new vehicle (120,000 contacted; response rate < 1%))
- the *e-Rewards*™ panel[1] of new vehicle buyers (12,025 contacted; response rate ~~5~~about 25%)

The survey was conducted September 8-22, 2010.

Data Management and Analysis

The data from all versions of the survey were merged into one database for analysis purposes. Those who indicated that they had not purchased a vehicle were dropped from the final database. In addition, the time that it took respondents to complete the survey was calculated. Any respondent who completed the survey in less than five minutes was considered to have "blown through" the survey (i.e., could not have read/considered the questions carefully enough to provide valid information) and was dropped. Finally, response range and logic checks were performed in order to identify any miscoded variables. The final data set for this analysis (n = 3,169) consists of respondents overwhelmingly from the e-Rewards panel, but it includes some respondents from Autobytel.[2]

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[1] The e-Rewards panel (part of *ResearchNow*™ [HYPERLINK "http://www.researchnow.com/"]) is among the most highly rated of such online survey panels, and has a global automotive panel of over 1.5 million panelists. Respondents are paid a small fee ($1.25) for completing surveys. A number of government projects have used e-Rewards panelists, including but not limited to surveys conducted for the United States Department of Homeland Security and the United States Department of Defense.

[2] The responses include 191 people who self-identified as intending to buy a new vehicle, rather than having bought a new vehicle. These people came from the Autobytel database, because there were no "intenders" in the

A comparison of respondent demographics across the six versions of the survey indicated no statistically significant differences, except that age for those who viewed the Label 3 design was slightly older than those who viewed the other two label designs. Respondents came from all fifty states and the District of Columbia.

The results of these surveys are not intended to be representative of any larger group of new vehicle buyers and reflect only the experience of those who completed the survey.

e-Rewards panel. Because intenders were found to be demographically different from buyers, the intenders were excluded from the analyses presented here. Due to omission of an identifier in the e-Rewards panel responses, the buyers from the Autobytel panel cannot be distinguished from the e-Rewards panelists. They are likely to be a small enough number that they will not significantly affect the results.

Topline 'Understanding' Question Results

Respondents' *understanding* of the labels was tested by showing them a series of label pairs. In each pair, respondents were asked to identify which vehicle was better to use for trips of specified distances. "Better" was chosen as the comparison word, rather than "more fuel-efficient" or "less costly," to allow respondents to decide on their own what information on the label they would use. Answers may therefore reflect individuals' idiosyncratic attitudes and assumptions; as a result, "incorrect" answers may result for reasons other than the information on the labels. Because those idiosyncrasies are expected to be distributed randomly across the label designs, differences in responses across label designs are expected to be due to the label designs. EPA has chosen to define the objectively "better" answers to these questions based on fuel cost, fuel economy, GHG emissions, and vehicle range and will identify this as the "correct" answer for purposes of the discussion below. Responses of "Both are equally good" are included in the "incorrect" answers.
Below we have presented the results from each label pair, preceded by a brief description of some of the key metrics shown on each label. Two questions were asked for each label pair: which was "better" for a short distance (20-30 miles), and which was "better" for a long distance (120 miles).

The results indicate large differences in the proportion of "correct" answers from question to question, as either the driving distance or the vehicle technologies ~~have~~ changed. While Label 2 tended to lead to more "correct" results than Labels 1 or 3, ~~T~~the differences in "correct" answers across label designs in response to any individual question are much smaller than the differences from question to question.

The "correct" answer is B, due to the higher efficiency and lower operating costs of the electric vehicle.

In this comparison, regardless of label design, respondents gave a high proportion of "correct " answers. Average "correct" response was 77.5%, with the proportion of "correct" responses across label designs varying from 70% to 83%.[3]

The "correct " answer is A, because the range for the electric vehicle is less than the trip distance.

In this comparison, all three labels produced a large proportion of "incorrect " answers compared to the answers for the 30-mile range. Average "correct" response is 50.5%, with the proportion of "correct" responses across label designs varying from 48% to 52%.[4]

[3] Statistically significant: Cramer's V = .132, p = .000
[4] Statistically not significant: Cramer's V = .037, p = .154

The agencies identified the "correct" answer as A since both vehicles will operate in the mode using electricity, and the EREV is more fuel-efficient and less costly to operate in that range.

In this comparison, all three labels produced a large proportion of "incorrect" answers. Average "correct" response is 45.5%, with the proportion of "correct" responses across label designs varying from 39% to 52%.[5]
The "correct" answer is B, based on a weighted average of fuel costs for the two modes that would be used over the distance. The PHEV's gasoline mode is sufficiently more efficient than that for the EREV to outweigh the higher efficiency of the EREV for the mode using electricity.

In this comparison, all three labels produced a majority of "correct" answers. Average "correct" response is 55.5%, with the proportion of "correct" responses across label designs varying from 53% to 60%.[6]

The "correct" answer is B, due to the greater efficiency and lower operating cost for the electric vehicle.

In this comparison, all three labels produced a solid majority of "correct" answers. Average "correct" response is 61%, with the proportion of "correct" responses across label designs varying from 57% to 65%.[7]
The "correct" answer is A, because the range for the electric vehicle is shorter than the trip length.

In this comparison, all three labels produced a large proportion of "incorrect" answers. Average "correct" response is 49%, with the proportion of "correct" responses across label designs varying from 45% to 54%.[8]
Respondents were then asked what parts of the label they had used in making their choices. Based on the table below, the following three metrics were used most often:

- Fuel economy (especially on labels 3 and 2)
- Vehicle range (especially on labels 2 and 3)
- Gasoline and/or electricity consumption (similarly on all labels)

Regression results (presented in the Appendix) provide these additional observations.

Explanatory variables that tended to *increase* the likelihood of identifying the "correct" answer include:
Fewer than 5 licensed drivers in the household

[5] Statistically significant: Cramer's V = .104, p = .000
[6] Statistically significant: Cramer's V = .062, p = .005
[7] Statistically significant: Cramer's V = .064, p = .004
[8] Statistically significant: Cramer's V = .074, p = .001

Being male
Not being the fastest adopter of new technology
More education
Having 5 or more household vehicles

These results, with the exception of "Male," are inconsistent across the regression results: that is, they are not statistically significantly different from zero for all the questions.

The classes of vehicles people considered buying appear to have some explanatory power as well. For instance, people who considered purchasing compact cars appear to have a higher likelihood of answering "correctly." These vehicle class variables may be serving as proxies for some personal characteristics not picked up in the other demographic variables.

Topline 'Influence' Question Results

To test the potential *influence* of the labels on vehicle purchases, respondents saw pairs of labels for vehicles. They were asked:

> Assuming the same make and model of vehicle for both labels above and assuming that both vehicles met all your other requirements (including size, reliability, comfort, performance, appearance, and safety) and are identical in purchase price, which vehicle would you purchase when you consider your typical travel pattern?

Because driving patterns of respondents were distributed randomly across the label designs, differences in responses across label designs are expected to be due to the label designs. In these questions there is no correct answer. Respondents identify their preferred vehicles based on their own decision factors.

The results in 3 of the 4 regressions suggest that Label 1 and possibly Label 3 are more influential than Label 2: those who saw either Label 1 or (in 2 of the 4 regressions) Label 3 chose the "more often preferred" vehicle more often than those who saw Label 2.

Regression results in the Appendix show that, in 3 of the 4 comparisons, respondents who drove fewer miles per day had a greater tendency to select the vehicle with a lower-cost short range. This result suggests that people did think about daily driving patterns when making their choices.
Below we have presented the results from each label pair, preceded by a brief description of some of the key metrics shown on each label.

In this comparison, regardless of label design, most respondents chose the conventional gasoline engine vehicle. Average proportion choosing the gasoline vehicle is 63%, with the proportion choosing the gasoline vehicle across label designs varying from 58% to 70%.[9]

Regression results for this comparison (see the appendix) suggest the following factors tend to increase the likelihood of choosing the gasoline vehicle:

- Driving more than 20 miles on a typical day
- A larger share of highway driving
- Being slow to adopt new technologies

In this comparison, regardless of label design, most respondents chose the electric vehicle. Average proportion choosing the electric vehicle is 65%, with the proportion choosing the electric vehicle across label designs varying from 60% to 68%.[10]

[9] Statistically significant: Cramer's V = .084, p = .000

Regression results for this comparison (see the appendix) suggest the following factors tend to increase the likelihood of choosing the electric vehicle:

Being under age 65
Being female
Driving less than 80 miles on a daily basis
Ranking the fuel economy label very highly in the decision process

In this comparison, there is more of an even split between the two vehicle types, with half overall choosing the Electric Vehicle (50%) and another 11% indicating that they would be equally likely to purchase either vehicle. Average proportion choosing the electric vehicle is 50%, with the proportion choosing the electric vehicle across label designs varying from 44% to 53%.[11]

Regression results for this comparison (see the appendix) suggest the following factors tend to increase the likelihood of choosing the electric vehicle:

Being female
Being below age 45
Having 1 or 2 vehicles in their household
Driving less than 70 miles on a typical day

In this comparison, regardless of label design, most respondents chose the Plug-in Hybrid Electric Vehicle (PHEV). Average proportion choosing the PHEV is 59%, with the proportion choosing the PHEV across label designs varying from 58% to 61%.[12]

Regression results for this comparison (see the appendix) suggest the following factor tends to increase the likelihood of choosing the PHEV:

Higher proportion of highway miles

Respondents were then asked what parts of the label they had used in making their purchase choices. Based on the table below, the following four metrics were used most often:

- Fuel economy (especially on labels 3 and 2)
- Vehicle range (especially on labels 2 and 3)
- Gasoline and/or electricity cost (especially for label 3 and 2)
- Gasoline and/or electricity consumption (especially for label 3)

[10] Statistically significant: Cramer's V = .050, p = .009
[11] Statistically significant: Cramer's V = .069, p = .000
[12] Statistically not significant: Cramer's V = .023, p = .569